

ABSTRACT OF THE DISCLOSURE

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10 An indirectly heated button cathode for use in the ion  
source of an ion implanter has a button member formed of a slug  
of tantalum mounted in a collar of tungsten. The lower  
thermionic work function of tantalum causes electron emission to  
be concentrated over the surface of a tantalum slug. The  
tantalum slug may be mounted to enable it to operate at a higher  
temperature compared to the surrounding tungsten collar portion.  
The resultant concentrated plasma in the ion source is effective  
to enhance the production of higher charge state ions,  
15 particularly P<sup>+++</sup> for subsequent acceleration for high energy  
implantation.

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